

## ***Interactive comment on “A new method of rainfall temporal downscaling: a case study on sanmenxia station in the Yellow River Basin” by G. F. Chen et al.***

**G. F. Chen et al.**

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Dear Sir, Your comments really helped us to increase the scientific quality of our manuscript. We agree to take into account your comments/suggestions in the revised manuscript submission. Please find below the reply to your comments step by step.

RC: The abstract is not very informative; it should include all of the keynotes more quantitatively and clearly;

Author reply: The abstract will be rewritten in the revised manuscript to meet your suggestion. And it will be checked by native English speakers.

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RC: What is the temporal resolution of Sanmenxia station?

Author reply: the temporal resolution of Sanmenxia Station is one hour in rainstorm with duration longer than one hour; if the duration is shorter than one hour, the resolution is the duration of the single rainfall event.

RC: Only one station can not represent the Yellow River basin. More stations need to be used and tested;

Author reply: The area of the middle reach of the Yellow River Basin is the a typical area with a lot heavy rainfall and rainstorm events. Most floods with high peak values come from that area. And the Sanmenxia Station is a very important station in the middle reach of the Yellow River Basin. Two other stations , Anningdu Station and Tangnaihahai Station, are tested in the article, shown in Fig. 7 . Sanmenxia Station is selected as the calibration station.

RC: In page 2327, from 15 to 20, the description is very confusing and hard to understand. No figures No. are mentioned; Author reply: It is really a big problem in our manuscript. It is hard to compare different rainfall process lines. Such as shown in Fig. 1. In order to compare them and select an typical line, the lines are moved together as shown in Fig. 2. Then we can get the outsourcing curve easily. RC: For each method except for the self-improved one, references should be mentioned, which will be convenient for reader to seek the sources; Author reply: References about these methods are mentioned in the part “introduction”, and they will be mentioned in the other parts of the manuscript if it is necessary.

RC: The comparison in Fig 8 and Fig 9 are meaningless, the observed and simulated values should occupy the same axis, or time series of difference between them can be acceptable;

Author reply: Thank you for pointing out a big mistake in the manuscript. Titles of these two Figures are wrong, the title for Fig.8 should be “Comparison between the simulation

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hyetograph of proportional distribution method(above) and normal distribution method (below) to the actual hyetograph of the first calibration time series”, and the title of Fig.9 should be “Comparison between the simulation hyetograph of proportional distribution method(above) and normal distribution method (below) to the actual hyetograph of the second calibration time series”. We want to use these two figures to show the differences of the simulation results by proportional distribution method and the normal distribution method. The difference is obvious in Fig.9 for the second calibration time series, the simulation values by the normal distribution method are far lower than the actual ones while the simulation values by the proportional method are close to the actual ones except one.

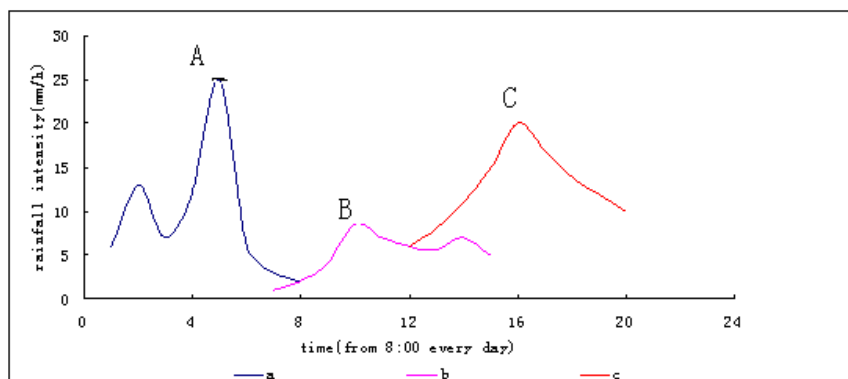
RC: The English writing need to be improved. In fact, grammar errors are very popular.

Author reply: The manuscript will be checked by native English speakers carefully in the following days.

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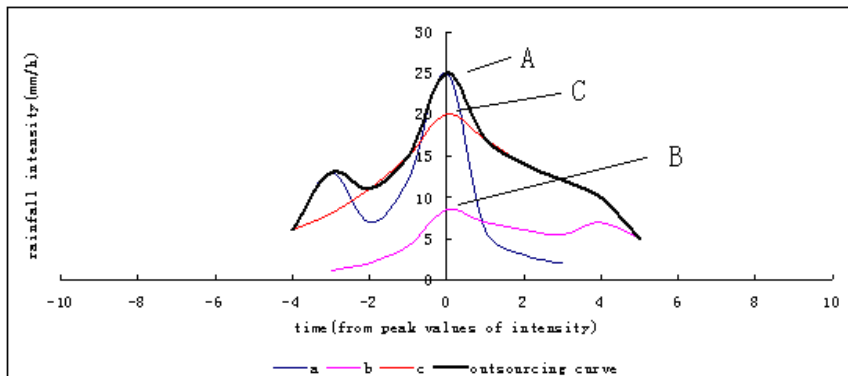
Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 8, 2323, 2011.

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**Fig. 1.** different rainfall process lines a, b ,c with peak intensity values of A, B, and C.

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**Fig. 2.** different rainfall process lines a, b, c have been moved together.